REMARKS/ARGUMENTS

Claim Amendments

The Applicant has amended claims 1, 11 and 12; new claims 23-25 were added and support for claims 23, 24 and 25 may be found on page 18, line 5 to page 20, line 28. Support for the other claim amendments may be found in the Summary. Applicant respectfully submits no new matter has been added. Accordingly, claims 1-12 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

Claim Rejections – 35 U.S.C. § 103 (a)

Claims 1-8 and 10-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Radha et al (US Patent No. 6,700,893 B1) in view of Zhu et al (US 6,085,252) and Balachandran et al US7,068,619 B2. The Applicant traverses the rejection of these claims and respectfully directs the Examiner's attention to amended claim 1.

> 1. (Currently Amended) A method for retransmitting a plurality of data packets from a sender to a receiver, wherein the data transmission is performed over a link with limited transmission capacity, and a presentation time is defined for a first data packet of said plurality, wherein the receiver performs a first check whether data packets are correctly received and selects a data packet for retransmission according to the result of the first check, the method comprising:
>
> determining a delay budget from the presentation time of the first data packet, the delay budget indicating the amount of time by which the first data packet can be delayed without resulting in a buffer underflow;
>
> determining a delay requirement for the retransmission of the selected data packet from the limit of the transmission capacity and from the transmission capacity required for the selected at least one data packet;
>
> comparing the delay requirement and the delay budget; and
>
> selectively retransmitting the first data packet if the delay budget is at least equal to the delay requirement, otherwise cancelling the retransmission of the data packet. (emphasis added)

The Applicant respectfully asserts that the Radha, Balachandran and Zhu references, individually or in combination, do not disclose at least the emphasized limitations.

The Examiner indicated that a new ground of rejection, the Balachandran reference, is now made. The rejection of claim 1 as being unpatentable begins with portions of the Radha reference being cited as disclosing certain limitations of claim 1. The Radha reference is cited as disclosing "determining a delay budget from the presentation time of the first data packet". The Examiner in the Response to Arguments noted that the Applicant had persuaded the Examiner of the lack of this limitation in Radha. Therefore, the Applicant agrees with the Examiner that the delay budget limitation is not found in the Radha reference.

The Applicant's invention addresses the problem of self-congestion (p. 3, lines 15-22) which is caused by retransmission packets over a bottleneck link; "...the data transmission is performed over a link with limited transmission capacity...". The Radha reference does not address "limited transmission capacity" and is directed to avoiding unnecessary transmissions due to delay jitter (col. 1, lines 45 - 47; col. 2, lines 21 - 40). The Radha reference avoids unnecessary retransmissions of a delayed packet but, Radha always requests retransmission, in contrast to the Applicant's invention, which is not addressed at all by the Radha reference. If the bandwidth (transmission capacity) of a link is limited, the Radha retransmission scheme works fine for the retransmitted packet BUT this retransmission may delay other, in particular later, original packets; a feature and limitation not considered by Radha.

Correspondingly, the Applicant's delay budget is defined as the time which can be attributed to retransmissions without delaying original data packets (page 5, lines 29-30). Another way to define the delay budget is the amount of time that an original data packet can be delayed without causing a buffer underflow (page 15, lines 17-20). If such a delay budget is not available, the retransmission is not performed and some transmissions are cancelled (page 17, lines 19-21). Radha does not teach or suggest this definition of delay budget, nor the cancelling of a retransmission

The Balanchandran reference is cited for disclosing the delay budget indicating the amount of time by which original data packets can be delayed without resulting in a buffer underflow. The Applicant has reviewed the cited portion of Balachandran and respectfully disagrees with the comparison to the delay budget of the Applicant's

present invention. The cited portion discloses a step of determining a 'play out time' for a Radio Link Control block. The block referred to is a block of data. The play out time is described as a projected period that the RLC block would last (the time required for the block to play) according to a rate and allowed delay for the transmission of the block. Then an aborting recovery for the block is described if the RLC is not received by the play out time. The transmitter RLC may provide a play out reference to the receiver RLC by adding a UTR (Update Time Reference) bit to the RLC/MAC header. At each initial transmission of an RLC block, the transmitter RLC may set UTR=1 if the block sees a short (or no) queuing delay since these blocks will reflect the true RLC transmitter time reference to the RLC receiver.

The Applicant respectfully asserts that the budget delay for the Balanchandran reference is not the same as the Applicant's budget delay either as an equation or in the parameters used to calculate the budget delay. As described in Balanchandran, the RLC transmitter provides the play out reference by adding the UTR to the RLC/MAC header. In other words, the budget delay uses a predetermined time reference to determine the play out time. On the other hand, the Applicant uses an equation to incorporate data rate at a bottleneck link (see new claims 23-25) which determines the budget delay, i.e., a time that a first data packet can be sent. This is determined by equations disclosed on pages 18-20. As is evident by the equations, the Balanchandran "delay budget" is calculated very differently from the Applicant's budget delay. The Applicant respectfully submits that the Balanchandran reference does not disclose the Applicant's budget delay for retransmitting a first data packet.

The Zhu reference is cited for selectively executing retransmissions. The Applicant has amended that limitation to more clearly claim the Applicant's invention. The Zhu reference does not disclose the above recited missing elements and the Applicant respectfully requests the allowance of claim 1.

Claims 11 and 12 are analogous claims and include similar limitations. Claims 2-8 and 10 depend from amended claim 1 and recite further limitations in combination with the novel elements of claim 1. Therefore, the allowance of claims 2-8 and 10 is respectfully requested.

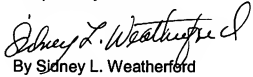
Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Radha, Zhu and Balachandran in further view of Hackenberg et al US Pat No. 6,792,470B2. The Applicant respectfully traverses the rejection of these claims and respectfully, the Applicant thinks that four references are a little much to cite as teaching obviousness. Even so, the Hackenberg reference fails to supply the limitations missing from the Balanchandran, Radha and Zhu references. That is, Hackenberg also fails to disclose or suggest at least the Applicant's definition and use of budget delay as set forth in amended claim 1. So, the Balanchandran, Radha, Zhu and Hackenberg references fail to suggest, teach or disclose, individually or in combination, all of the limitations in Claim 1. This being the case, the Applicant respectfully requests the allowance of claim 9.

CONCLUSION

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for all pending claims.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



By Sidney L. Weatherford
Registration No. 45,602

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Ericsson Inc.
6300 Legacy Drive, M/S EVR 1-C-11
Plano, Texas 75024

(972) 583-8656
sidney.weatherford@ericsson.com